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Claims:-

5 1. An isolated polynucleotide molecule encoding a human Vitamin D receptor (hVDR) isoform, said polynucleotide molecule comprising a nucleotide sequence which includes sequence that substantially corresponds or is functionally equivalent to that of exon 1d of the human VDR gene.

10 2. A polynucleotide molecule according to claim 1, wherein said nucleotide sequence further includes sequence that substantially corresponds or is functionally equivalent to that of exon 1b and/or exon 1c.

15 3. A polynucleotide molecule according to claim 1, wherein the nucleotide sequence includes:

15 (i) sequence that substantially corresponds or is functionally equivalent to that of exons 1d, 1c and 2-9 and encodes a VDR isoform of approximately 477 amino acids,

20 (ii) sequence that substantially corresponds or is functionally equivalent to that of exons 1d and 2-9 and encodes a VDR isoform of approximately 450 amino acids, or

25 (iii) sequence that substantially corresponds or is functionally equivalent to that of exons 1d and 2-9 and further includes a 152bp intronic sequence and encodes a truncated VDR isoform of approximately 72 amino acids.

25 4. A polynucleotide molecule according to claim 1, wherein the nucleotide sequence substantially corresponds to that shown as SEQ ID NO: 2, SEQ ID NO: 3 or SEQ ID NO: 4.

30 5. An isolated polynucleotide molecule encoding a human Vitamin D receptor (hVDR), said polynucleotide molecule comprising a nucleotide sequence which includes sequence that substantially corresponds or is functionally equivalent to that of exon 1f and/or 1e of the human VDR gene.

35 6. A polynucleotide molecule according to claim 5, wherein the nucleotide sequence further includes sequence that substantially corresponds or is functionally equivalent to that of exon 1c.

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7. A polynucleotide molecule according to claim 5, wherein the nucleotide sequence includes sequence that substantially corresponds or is functionally equivalent to that of exons 1f and 2-9.

5 8. A polynucleotide molecule according to claim 5, wherein the nucleotide sequence substantially corresponds to that shown as SEQ ID NO: 7.

10 9. A plasmid or expression vector including a polynucleotide molecule according to <sup>Claim</sup> ~~any one~~ of the preceding claims.

15 10. A host cell transformed with a polynucleotide molecule according to <sup>Claim 1 or 5</sup> ~~any one of claims 1-8~~ or a plasmid or expression vector according to claim 9 <sup>or 25</sup>

11. A host cell according to claim 10, wherein the cell is a mammalian cell.

12. A host cell according to claim 10, wherein the cell is a NIH 3T3 or COS 7 cell.

20 13. A method of producing a VDR or VDR isoform or functionally equivalent fragments thereof, comprising culturing a host cell of <sup>Claim 10</sup> ~~any one of claims 10-12~~ under conditions enabling the expression of the polynucleotide molecule and, optionally, recovering the VDR or VDR isoform or functionally equivalent fragments thereof.

25 14. A method according to claim 13, wherein the VDR or VDR isoform or functionally equivalent fragments thereof are expressed onto the host cell membrane or other sub-cellular compartment.

30 15. A human Vitamin D receptor (hVDR) isoform or functionally equivalent fragment thereof encoded by a polynucleotide molecule according to <sup>Claim 1</sup> ~~any one of claims 1-4~~, said hVDR isoform or functionally equivalent fragment thereof being in a substantially pure form.

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16. An antibody or antibody fragment capable of specifically binding to a VDR isoform according to claim 15.

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17. A non-human animal transformed with a polynucleotide molecule according to <sup>Claim 1 or 5</sup> any one of claims 1-8.

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18. A method for detecting agonist and/or antagonist compounds of a VDR isoform of claim 15, comprising contacting said VDR isoform, functionally equivalent fragment thereof or a cell transformed with and expressing a polynucleotide molecule according to <sup>Claim 1</sup> any one of claims 1-4, with a test compound under conditions enabling the activation of the VDR isoform or functionally equivalent fragment thereof, and detecting an increase or decrease in the activity of the VDR isoform or functionally equivalent fragment thereof.

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19. An oligonucleotide or polynucleotide probe comprising a nucleotide sequence of 10 or more nucleotides, the probe comprising a nucleotide sequence such that the probe specifically hybridises to a polynucleotide molecule according to <sup>Claim 1 or 5</sup> any one of claims 1-8 under high stringency conditions.

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20. An antisense polynucleotide molecule comprising a nucleotide sequence capable of specifically hybridising to a mRNA molecule which encodes a VDR or VDR isoform encoded by a polynucleotide molecule according to <sup>Claim 1 or 5</sup> any one of claims 1-8, so as to prevent translation of the mRNA molecule.

*Sub C2* 30  
21. An isolated polynucleotide molecule comprising a nucleotide sequence showing greater than 75% sequence identity to:

*(i)* 5'TGCGACCTTGGCGGTGAGCCTGGGGACAGGGGTGAGGCCAGAGA  
CGGACGGACGCAGGGGCCCGCCAAGGCGAGGGAGAACAGCGGCACCA  
AGGCAGAAAGGAAGAGGGCGGTGTGTTCACCCCGCAGCCCAATCCATCAC  
TCAGCAACTCCTAGACGCTGGTAGAAAGTTCCCTCCGAGGGAGCCTGCCATC  
35 CAGTCGTGCGTGCAG3' (SEQ ID NO: 5)

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(ii) 5'AGGCAGCATGAAACAGTGGATGTGCAGAGAGAAGATCTGGTC  
CAGTAGCTCTGACACTCCTCAGCTGTAGAAACCTTGACAACTCTGCACAT  
CAGTTGTACAATGGAACGGTATTTTACTCTTCATGTCTGAAAAGGCTA  
TGATAAAAGATCAA3' (SEQ ID NO: 6), or

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(iii) 5'GTTTCCTTCTTCTGTGGGGCGCCTTGGCATGGAGTGGAGGAATA  
AGAAAAGGAGCGATTGGCTGTCATGGTGCTCAGAACTGCTGGAGTGG  
GG3' (SEQ ID NO: 1)

10 22. An isolated polynucleotide molecule comprising a nucleotide sequence showing greater than 85% sequence identity to:

(i) 5'TGCGACCTTGGCGGTGAGCCTGGGACAGGGGTGAGGCCAGAGA  
CGGACGGACGCAGGGGCCCGGCCAAGGCGAGGGAGAACAGCGGCAC  
AGGCAGAAAGGAAGAGGGCGGTGTTCACCCGAGCCCAATCCATCAC  
TCAGCAACTCCTAGACGCTGGTAGAAAGTTCTCCGAGGAGCCTGCCATC  
CAGTCGTGCGTGCAG3" (SEQ ID NO: 5)

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(ii) 5'AGGCAGCATGAAACAGTGGATGTGCAGAGAGAAGATCTGGTC  
CAGTAGCTCTGACACTCCTCAGCTGTAGAAACCTTGACAACTCTGCACAT  
CAGTTGTACAATGGAACGGTATTTTACTCTTCATGTCTGAAAAGGCTA  
TGATAAAAGATCAA3' (SEQ ID NO: 6), or

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(iii) 5'GTTTCCTTCTTCTGTGGGGCGCCTTGGCATGGAGTGGAGGAATA  
AGAAAAGGAGCGATTGGCTGTCATGGTGCTCAGAACTGCTGGAGTGG  
GG3' (SEQ ID NO: 1).

25 23. An isolated polynucleotide molecule comprising a nucleotide sequence showing greater than 95% sequence identity to:

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(i) 5'TGCGACCTTGGCGGTGAGCCTGGGACAGGGGTGAGGCCAGAGA  
CGGACGGACGCAGGGGCCCGGCCAAGGCGAGGGAGAACAGCGGCAC  
AGGCAGAAAGGAAGAGGGCGGTGTTCACCCGAGCCCAATCCATCAC  
TCAGCAACTCCTAGACGCTGGTAGAAAGTTCTCCGAGGAGCCTGCCATC  
CAGTCGTGCGTGCAG3' (SEQ ID NO: 5)

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(ii) 5'AGGCAGCATGAAACAGTGGATGTGCAGAGAGAAGATCTGGTC  
CAGTAGCTCTGACACTCCTCAGCTGTAGAAACCTTGACAACCTGCACAT  
CAGTTGTACAATGGAACGGTATTTTACTCTTCATGTCTGAAAAGGCTA  
TGATAAAAGATCAA3' (SEQ ID NO: 6), or

5 (iii) 5'GTTTCCTTCTTCTGTCGGGGCGCTTGGCATGGAGTGGAGGAATA  
AGAAAAGGAGCGATTGGCTGTCATGGTGCTCAGAACTGCTGGAGTGG  
GG3' (SEQ ID NO: 1)

10 24. An isolated polynucleotide molecule comprising nucleotide sequence  
substantially corresponding to:

(i) 5'TGCGACCTTGGCGGTGAGCCTGGGACAGGGTGAGGCCAGAGA  
CGGACGGACGCAGGGGCCGGCCAAGGCAGGGAGAACAGCGGCACTA  
AGGCAGAAAGGAAGAGGGCGGTGTTCACCCGAGCCAATCCATCAC  
TCAGCAACTCCTAGACGGCTGGTAGAAAGTTCTCCGAGGAGCCTGCCATC  
CAGTCGTGCGTGCAG3' (SEQ ID NO: 5)

15 (ii) 5'AGGCAGCATGAAACAGTGGATGTGCAGAGAGAAGATCTGGTC  
CAGTAGCTCTGACACTCCTCAGCTGTAGAAACCTTGACAACCTGCACAT  
CAGTTGTACAATGGAACGGTATTTTACTCTTCATGTCTGAAAAGGCTA  
TGATAAAAGATCAA3' (SEQ ID NO: 6), or

20 (iii) 5'GTTTCCTTCTTCTGTCGGGGCGCTTGGCATGGAGTGGAGGAATA  
AGAAAAGGAGCGATTGGCTGTCATGGTGCTCAGAACTGCTGGAGTGG  
GG3' (SEQ ID NO: 1)

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